

REMARKS

Claims 1 through 10 were presented for examination and all of the claims have been rejected under Section 112 for various reasons.

The Examiner has objected to the phrase "conjugated diene," the phrase "hydroxy group-containing compound," the phrase "a source of palladium anions," the phrase "a phosphorus containing ligand," the phrase "a source of anion," the phrase "a substituted or unsubstituted cyclic group," the phrase "bivalent organic bridging group," the phrase "substituted or unsubstituted [3,3,1] or [4,2,1] 9-phosphabicyclononyl group," the phrase "phosphabicyclononyl rings . . . substituted with one or more alkyl groups having from 1 to 4 carbon atoms . . .," and "protonic acid with a pKa value > 1 . . . or a salt . . ." The Examiner also objects to claim 1 because of the use of "and/or" and to claim 10 because the steps of the method are not described.

The foregoing amended claims and new claims are submitted in response to the Section 112 rejections. The Applicants assert that the amendments overcome the Section 112 rejections and that the objection to the term conjugated diene is incorrect. Thus, the rejections are respectfully traversed.

The Applicants believe that the scope of the claims should not be limited further than the term "conjugated diene" in claim 1. Conjugated dienes are a special class of dienes and anyone skilled in the art would, after the observation that butadiene can be efficiently carbonylated, understand that any conjugated diene can be suitably carbonylated in the same manner, particularly 1,3-conjugated dienes such as 1,3-pentadiene, isoprene, 1,3-octadiene, etc. The Applicants assert that the claims should not be limited further than the term "conjugated diene."

The claims have been amended to specify that the hydroxyl group containing compound was selected from the group consisting of alkanols and alkane diols. This amendment is based upon page 4, lines 14 through 17 of the specification wherein the preferred hydroxyl group containing compounds are specified as alkanols and alkane diols. The Applicants assert that this is sufficiently definite for one of ordinary skill in the art to successfully follow the process for carbonylation of conjugated dienes.

Claim 1 has been amended to specify palladium salts in place of the objected to term "a source of palladium cations." The basis for this amendment is found at the bottom of page 5 carrying over to the top of page 6 of the specification wherein it is stated that a suitable

source of palladium cations are its salts. The Applicants assert that the claims should not be further limited.

Claim 1 has been amended to specify the use of a protonic acid having a pKa of greater than 1. The basis for this amendment is found at page 9, lines 23-25 of the specification. The Applicants assert that the term is sufficiently definite for use in the present claims because one of ordinary skill in the art would certainly understand what a protonic acid is and could determine which protonic acids have a pKa value of greater than 1.

Claim 1 has been amended to specify that X¹ and X² are cyclic groups containing one phosphorus atom and the rest carbon atoms and that any substitution is provided by a hydrocarbyl group which contains carbon atoms and hetero atoms. The basis for these amendments is found at the bottom of page 6 carrying over through page 7 of the specification. Cyclic groups containing all carbon atoms except for one phosphorus are clearly described therein. Furthermore, the substitution of the cyclic groups is stated to be able to be provided by one or more suitable hydrocarbyl groups containing carbon atoms and/or hetero atoms. The Applicants assert that this provides sufficiently specific description and direction to ligands which can be used in the catalyst system of the present invention in combination with the limitation discussed immediately below.

Claim 1 has also been amended to specify that the bridging group R contains 2 or 3 carbon atoms in the bridge. The basis for this amendment is found on page 8 of the specification wherein all of the ligands described are either ethane or propane (2 or 3 carbon atoms).

There is prior art which describes four carbon atom bridged ligands of this kind. The present invention as presently claimed, describes smaller bridging groups that provide the chelation necessary for improved results which is not provided by a four carbon atom bridged ligand. The examples show that improved results are achieved when such 2 or 3 carbon atom bridging group ligands are used--see Examples 1, 2, 3, and 4 which are examples of this preferred embodiment. These examples provide the best results of all of the examples provided in the specification including Example 5 which shows an initial rate of carbonylation which is lower than that produced in Examples 1 through 4.

The Applicants assert that the term "substituted or unsubstituted [3,3,1] or [4,2,1] 9-phosphabicyclononyl group" is sufficiently definite as utilized in the present claims. This group is described at length at the bottom of page 6 carrying over to page 7 of the present specification. The type of substitution which can be present is also described.

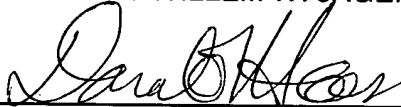
The term "phosphabicyclononyl rings" was objected to. The Applicants assert that this rejection has been overcome by the removal of the word "rings" and its replacement by the proper antecedent word "group."

Conclusion

The Applicants assert that the amendments which have been made to claim 1 and the other claims provide sufficient definiteness that one of ordinary skill in the art would understand the invention as presently claimed and would be able to follow its teachings. Some of the Examiner's suggestions are much too narrow in light of the disclosure and description which was provided in the body of the specification. An early notice of allowance is respectfully requested.

Respectfully submitted,

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